

Abstract

Objects of the present invention are to generate vaccine strains that undergo reversion (atavism) with difficulty and to provide smallpox vaccines with higher safety. The vaccine viruses are deficient in a part or the whole
5 of the B5R gene of a vaccinia viral strain, LC16m8 or LC16mO, and produce no B5R gene products having normal functions. The vaccine viruses can be used as smallpox vaccines or vectors capable of expressing foreign genes. Hence, smallpox vaccines and vaccinia virus vectors are provided that produce no B5R gene products having normal functions due to reverse
10 mutation.